Students-Future Teachers' Self-Assessment of Competence for Computer-Assisted teaching

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Abstract

Teaching has, as expected, changed over the course of time. Except the content itself, modernisation of organized education often emphasizes the material which is used to complement the lesson. The IT equipment is generally highlighted in that matter, especially during the last curricular reform. However, the competence of the teacher who will be using that equipment must not be neglected, which is why his qualifications for work on the highest technological level are being discussed. That is why a research has been conducted which enquired into the opinions and views of students about new technological possibilities in their future profession. The research has been conducted via a questionnaire amongst the fifth year students of a teaching college. The focus was on the students' self-assessment of their competence for using the IT equipment, as well as their opinions and views about teaching by using the aforementioned equipment at the expense of the so-called «chalk/chalkboard» method, which dominated the classrooms until recently. The participants have also proposed how much they intend to use the IT equipment to reach their didactical goals. For instance, the research has shown that the participants regard themselves as competent for teaching with the IT equipment and that they plan to use multimedia content, but also that not many of them expected to work in a school that will enable them to do so. That could be significant considering that many of them feel that their performance would be enhanced with a computer, a projector and an internet connection. The participants expect their students to be skilled in working with a computer as well since they plan to assign homework that can only be completed with a computer. In conclusion, the participants regard themselves as competent for teaching by using the computer. Although they claim that they had practiced teaching without the IT equipment, if given a chance, they would like to enrich their classes with multimedia content.

> *This shows that they are ready for the highest technological level in their profession, which is accordant with the expectations of the curricular reform.*
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> **Keywords:** *IT equipment in the classroom; multimedia content in the classroom; the «chalk/chalkboard» method.*

Introduction

We are everyday witnesses to the unstoppable progress of technology. As a post-industrial society, we use it in order to carry out tasks more easily. Its ubiquity enables for it to be accessible and allows for it to be implemented into everyday activities, both privately and professionally. Therefore, it was only a matter of time before technology had become an integral part of school activities. The extensive body of research (Tolić, 2008; Ismajli, 2008; Gürbüz et al., 2009; Dogan, 2010; Tot, 2010; Batarelo Kokić, 2014; Letina, 2015) on this topic provides proof that the discussion on technology, along with its possibilities, limitations and variations in approach goes back more than a decade.

The basic paradigm of contemporary teaching is an active student. Their ability to stay involved and reach their own conclusions is vital to the success of class (Mrkonjić & Vlahović, 2008). The teachers have to be able to bypass the passivity of the pupils. According to some research, this can be accomplished by implementing technology into the teaching process. This provides the pupils with a more active role (Gürbüz et al., 2009), leaving behind their role of observers and recipients of contents, and also stimulates their involvement. It also increases the efficiency of their work, resulting in improved learning results.

Developing a child's autonomy should begin as early as kindergarten (Slunjski, 2011), while the time that the child spends in mandatory education should serve to bring this development to its optimal level. After having finished levels of educations, the pupils should be able to fulfil everyday tasks on their own. This is why it is vital to develop their logical thinking, with the goal of tying everything that is being taught into a unified whole (Tot, 2010). Implementing technology into teaching becomes important in this, as Koludrović and Reić Ercegovac (2010, p. 436) explain: "The goals and tasks of teaching are no longer aimed at the reproduction of content and memorizing facts and encyclopedic knowledge. The school has an obligation to teach their students how to find useful information and then utilize it in day-to-day life".

However, it should be kept in mind that media, as useful as it may be, still requires careful use (Tolić, 2008). Useful information is readily available on the Internet, but the digital world also contains a plethora of dangers. The pupils are one click away from false information, which is why a teacher's guidance is essential. The pupils can't be expected to predict where troubles may occur when working with a computer, as this should be the teacher's task, one they have to be properly prepared to take on. At this point, the teacher leaves behind the role of the lecturer and becomes an assistant (Gürbüz et al., 2009), solidifying himself better in the activities of the pupils during the class.

The teacher's competence when using technology is vital in this. Their understanding of the tools being used is essential when we consider the speed with which new technologies are developed and improved. The increasing speed of technological progress means that certain segments of it might be rendered obsolete in a short period of time (Dogan, 2010), meaning that the user has to constantly update their competence in using those tools in order to more efficiently perform the tasks at hand. This thesis ties in to the discussion on the necessity of lifelong process of learning new skills and perfecting old ones, but as this is not the topic of this research, I will go no further into it.

Pupils want to be actively involved in the teaching process. That is why it is up to the teacher to implement this work model (Mrkonjić & Vlahović, 2008). Recent studies (Ismajli, 2008; Gürbüz et al., 2009) have shown that students consider classes which implement technology to be superior to those that don't, and the same thing was found to be true for teachers. Taking into consideration that everyone involved in the teaching process consider technology a benefit, we must pose the question whether its implementation will become the expected norm, and whether those involved in the process are prepared for such a work model. I will try to answer both of these questions from the teacher's perspective in this paper.

Technology is implemented into the everyday activities of the educational system to such an extent that we must inevitably ask whether using it should be formally introduced into university curricula connected to teaching (Tolić, 2008). However, the tools necessary for this educational model are still an exception rather than a rule in most schools across Croatia, despite the positive attitudes towards it. There is a wide disconnect between these practices in theory and actual class, which the results of this research will touch upon. Regardless of gender or work experience, teachers rely heavily on computers and projectors in order to meet the goals of their respective classes. This is evident in the curricular reform in Croatia, which stipulates that all teachers be knowledgeable in the use of these tools.

This work model is introduced during college. The students are asked to come up with dynamic educational units which prevent the pupils from taking on a passive role. There is rising demand for planning and implementing a more research-oriented curriculum which will enable pupils to gain the abilities and skills necessary for their further progress (Koludrović, 2013). However, regardless of how much the students develop their skills in technologically equipped classrooms during their studies, it is uncertain if they will encounter the same once they are employed in schools. There have been examples of teachers planning out classes which rely on the use of laptops, only to discover that a colleague had taken the laptop for their own class (Letina, 2015). Situations such as these would surely prove to be a major roadblock to carrying out a successful lecture, especially so for inexperienced teachers.

Pupils are more likely to take active part during class as well as consider their role in the process in a more positive light when computers are used (Ismajli, 2008). The use

of the Internet also allows students to better acquire knowledge, develop research skills and access previously unavailable spaces (Letina, 2015). It is safe to assume that they are already familiarized with computers well due to their day-to-day use for private purposes, which is why it is important for the teachers to guide pupils towards their safe use. With proper guidance from their teachers, they can even learn about intercultural rules (Batarelo Kokić, 2014). The latter is the reason for bringing pedagogy of media into the centre of discussion as a new paradigm of education (Tolić, 2008) due to its importance in the pupil's development.

I have presented some of the reasons for approaching the question of necessity for the highest levels of competence of students currently studying to become teachers. Their self-assessment has shown us what to expect from the didactic-methodical approach in the future. Even though it has been shown that Croatia still hasn't reached the contemporary standard (Tot, 2014), the effort to shape future teachers in this direction should not be abandoned. Due to the computer's ubiquity amongst the younger generations, we could say that it is only necessary to build upon their existing knowledge and focus it towards creating a good methodical approach.

Methods

The goal of this research was to ascertain how students asses their own competence when it comes to being able to hold class with the aid of computer equipment (computers, projectors, internet access) as well as identify their attitudes towards this particular work model. The participants themselves were students of the final year of a Master's Degree course of Croatian Studies at the University of Zagreb, during the academic year 2017/2018. There were 33 participants aged 23-29. Amongst themselves they covered six different study courses. They were chosen because they had already attended the classes on these models of teaching, which was essential for the research to be carried out successfully. Figure 1 shows a detailed overview of the participants divided by gender, while Figure 2 presents the structure of the participants according to their course of study.
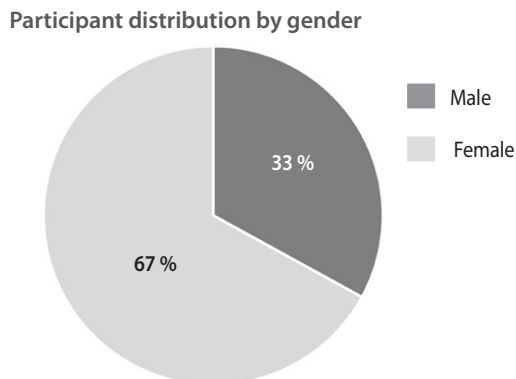

Figure 1. Participant distribution by gender

The students were presented with a questionnaire containing 20 prompts regarding the attitudes and opinions of these future teachers. They were asked to express their opinions if the use of computers is methodologically justified, and whether they expected an increase in the efficiency of their teaching unit. They also expressed their attitudes towards the use of multi-media tools, as well as whether they felt they were well-prepared to hold class without the use of technology. First, they answered questions regarding their use of computers in the private sphere, and were also offered to express their expectations from their future places of employment. For example, some prompts offered a connection between holding class with the aid of a computer and a classroom equipped with only a chalkboard. The questionnaire itself was structured using a four-point Likert scale with negative polarization (1 — I completely disagree, 2 — I disagree, 3 — I agree, 4 — I completely agree). The neutral value was omitted on purpose in order to avoid the so called *anchoring of the neutral value* (Matijević et al., 2016).
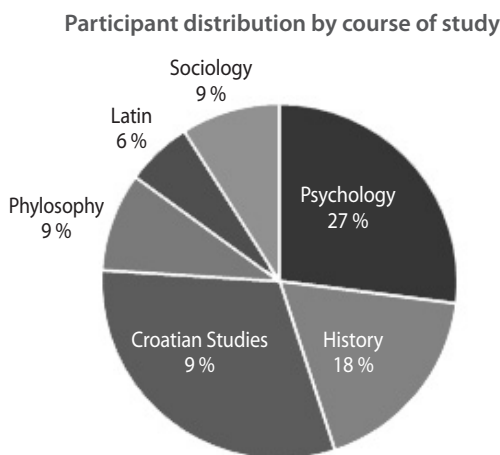
Participant distribution by course of study

Figure 2. Participant distribution by course of study

The results were processed using the descriptive and inferential statistical methods. The demographic data was presented through descriptive statistic (percentages and average values). The analysis of conditions for the calculation of the factor's structure has shown that the conditions were not met (the Kaiser-Meyer-Olkin test result was 0.4), so the claims in the questionnaire were analysed individually according to the predefined categories. The analysis of the variant showed that there was no statistically significant difference by any criteria in respect to the degree course that the students were enrolled in, or the category of the prompts in the questionnaire. The values on these individual claims and categories were represented through average values and standard deviations of the participants' answers.

Results and discussion

The average values of the participants' answers are listed in Table 1. The participants almost unanimously declared themselves capable of using computers for private purposes (M=3.90, SD=0.29). That first statement was vital in order to establish if there was a basis for working with computers in class. They also evaluated themselves equally capable of using computers in a professional environment during class. A small deviation appeared in regard to MS Excel (M=3.12, SD=0.59), which is rarely used to prepare classes when compared to MS Word for example (M=3.90, SD=0.29).

Table 1

Average values of the participants' answers

Question	M	SD
I know how to operate a home computer.	3.90	.29
I know how to use MS Word.	3.90	.29
I know how to use MS PowerPoint.	3.87	.33
I know how to use MS Excel.	3.12	.59
I know how to use an internet search engine.	3.96	.17
I use a home computer daily for private purposes.	3.81	.47
I feel I my study course has sufficiently prepared me to teach a class using a computer and a projector.	3.48	.75
I plan to structure class entirely around multimedia content.	2.53	.71
I have no plans to use a computer during class.	1.42	.56
I expect a computer and a projector available in every classroom of the school I am employed in.	2.87	.73
I will not be able to hold class without the aid of a computer and a projector.	1.48	.61
I would not accept employment in a school without a laptop and a projector in every classroom.	1.36	.60
I regularly use the Internet when preparing for class.	3.51	.61
I plan to assign homework which requires Internet research.	2.65	.60
I plan to use video clips during class.	3.27	.57
We have practiced holding class without the aid of a computer and a projector during our studies.	2.93	.82
I believe I am able to teach more efficiently when using a computer and a projector instead of a chalkboard.	3.09	.76
I believe I am able to teach more efficiently when using a chalkboard instead of a computer and a projector.	1.93	.49
The professors at my college always use a computer and a projector for lectures.	2.87	.89
The professors at my college never use a computer and a projector for lectures.	1.42	.56

There is an obvious disparity between the students' willingness to teach with the aid of computers and their expectations of whether their future place of employment will be satisfyingly equipped. For example, the statement *I feel that I am able to better accomplish the goals of the class with a computer and a projector than a chalkboard* has the average value of M=3.09 (SD=0.76). The participants have expressed clearly on the benefits of technology being implemented into teaching, undoubtedly as a result of their experiences during their university education. The statement *I plan to use video-materials during my classes* ties into this, and the average value shows the students' intentions to improve classes through multi-media supplements. However, a certain scepticism about the actual possibilities to implement these contents is visible, especially in the statement *I expect the school that I teach as to be equipped with a computer and projector in every classroom*, which has an average value of M=2.87 (SD=0.73).

Taking into consideration that a fully equipped classroom isn't the expected norm in Croatia's schools, we included the statement *I would not accept employment at a school without a computer and a projector in every classroom*. The goal was to see the students' willingness to adapt, and its average value, M=1.36 (SD=0.60), shows their awareness of the fact that ideal conditions might not be met. This can be presented as a positive tendency if interpreted as an intention to find creative solutions during class despite not having a computer, projector or internet access. The participants agreed with the statement *We practiced holding class without the use of technology during our studies*, which shows the students' willingness to adopt a more traditional teaching method.

The inseparability of technology and teaching is evident in the answers to the statement *I regularly use the Internet when preparing for class*. The students also agreed highly (M=3.51, SD=0.61) with the statement about using the Internet to supplement the contents of the class, even though the difference in their respective study courses made it hard to find out in which way. This inclination towards using technology as a way to improve classes is to be expected, especially due to the many advantages this holds over e.g. a textbook. However, it is important to keep in mind that these teaching supplements should in no way dominate the designated time intended for the educational unit.

Conclusion

This research has shown the students' readiness to implement technology on a wide scale. Their self-assessments are based on their previously acquired computer skills, which are most often associated with the younger populace, which they have in turn brought over into their work methods. They have shown an understanding of the benefits of technology-aided teaching, while at the same time being aware of the potential inequality when it comes to an individual school's ability to secure these tools. However, they expressed an interest in putting any possibility that might improve the efficiency of classes to use, including multi-media aids. These attitudes are in line with foreign research projects, which show qualitative progress in technology-aided teaching.

The downsides of the research can be largely contributed to a limited number of participants, caused by objective reasons. Even though the survey was taken part in by half of the students, it would have benefited from a larger sample, so adding results of similar research from other segments of the University would be useful. Taking into account the current widespread state of pedagogy studies, a sufficient sample of students can be expected. Furthermore, a deeper insight into the pupil's perspective would surely prove useful for the purposes of combining the final results and insight in order to produce an overall conclusion on the need for implementation of technology into classrooms.

It is important to note that the basis for a work model built on technology implementation already exists, as this is the first condition that has to be met for progress to occur. In the light of the discussion on the current curricular reform, which highlights the need to raise the quality grade of work done in education, such findings are valuable if we strive for a more efficient teaching process. Seeing how creating such an educational system would depend mostly on a new generation of teachers, some of which will have been the students who took part in this research, it is good to know that there is space to make such a leap.

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Samoprocjena kompetentnosti studenata-budućih nastavnika za izvođenje nastave pomoću računala

Sažetak

Izvođenje nastave očekivano se mijenja protokom vremena. Osim revizije sadržaja, samo osuvremenjivanje nastavnoga sata nerijetko postavlja pitanje radnoga materijala kojim će se upotpuniti nastavna jedinica. To se pitanje ponajviše odnosi na informatičku opremljenost učionica, o kojoj se naročito često govori u vrijeme posljednje kurikulne reforme. Međutim, ne smije se zanemariti ni kompetentnost nastavnika koji će tu opremu koristiti pa se iz tog razloga raspravlja o njegovoj osposobljenosti za rad na najvišoj tehnološkoj razini. Zbog toga je osmišljeno istraživanje kojim su se ispitali stavovi i mišljenja studenata nastavničkih studija o novim tehnološkim mogućnostima u njihovom budućem radu. Istraživanje je provedeno metodom anketnoga upitnika među studentima pete godine različitih nastavničkih studija. Ispitivala se njihova samoprocjena vlastitih kompetencija za rad na računalu, kao i stavovi i mišljenja o nastavi koja uključuje informatičku opremu nauštrb takozvane metode „ploča/kreda" koja je donedavno dominirala u školama. Sudionici su se također izjasnili o tome u kojoj mjeri planiraju koristiti se informatičkom opremom za ostvarivanje postavljenih ishoda u nastavi. Istraživanje je, primjerice, pokazalo da sudionici smatraju kako su kompetentni za izvođenje nastave pomoću informatičke opreme te da planiraju koristiti multimedijske priloge, ali i da malobrojni od njih očekuju da će raditi u okruženju koje će im to omogućiti. To je posebno značajno ako se uzme u obzir da u velikoj mjeri izjavljuju kako bi njihova nastava bila učinkovitija uz računalo, projektor i priključak na internet. Ispitanici u određenoj mjeri očekuju informatičku pismenost i od svojih budućih učenika s obzirom da, osim iskazivanja želje za izvođenjem nastave pomoću računala, planiraju zadavati domaću zadaću koju je nemoguće ispuniti bez računala. Izvodi se zaključak da se studenti smatraju kompetentnima za izvođenje nastave pomoću računala. Iako navode kako su tijekom studija uvježbavali izvođenje nastave bez informatičke opreme, pruži li im se prilika, žele obogatiti izvedbu svojih nastavni sati dodatnim sadržajem pomoću multimedijskih priloga. Time pokazuju kako su spremni za rad koji uključuje najvišu tehnološku razinu, što je u skladu s postulatima kurikulne reforme.

Ključne riječi: *informatička oprema u učionici; metoda „ploča/kreda"; multimedijski sadržaj u nastavi.*